



UNITED STATES PATENT AND TRADEMARK OFFICE

FP

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/996,446	11/28/2001	Daniel F. Downey	VRO-004.01	2412

7590 09/25/2003

GARY L. LOSER  
VARIAN SEMICONDUCTOR EQUIPMENT ASSOCIATES, INC.  
35 DORY ROAD  
GLOUCESTER, MA 01930

EXAMINER

HOLLINGTON, JERMELE M

ART UNIT	PAPER NUMBER
	2829

DATE MAILED: 09/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	09/996,446	DOWNEY ET AL.
	Examiner Jermele M. Hollington	Art Unit 2829

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 01 July 2003.

2a) This action is **FINAL**.      2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-20 is/are pending in the application.

4a) Of the above claim(s) 9-17 and 19 is/are withdrawn from consideration.

5) Claim(s) \_\_\_\_\_ is/are allowed.

6) Claim(s) 1-8, 18 and 20 is/are rejected.

7) Claim(s) \_\_\_\_\_ is/are objected to.

8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on 28 November 2001 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) The proposed drawing correction filed on \_\_\_\_\_ is: a) approved b) disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.

12) The oath or declaration is objected to by the Examiner.

#### Priority under 35 U.S.C. §§ 119 and 120

13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some \* c) None of:

- Certified copies of the priority documents have been received.
- Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
- Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) The translation of the foreign language provisional application has been received.

15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

#### Attachment(s)

1) Notice of References Cited (PTO-892)

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.

4) Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_.

5) Notice of Informal Patent Application (PTO-152)

6) Other: \_\_\_\_\_.

**DETAILED ACTION*****Election/Restrictions***

1. Claims 9-17 and 19 [see **Note** below regarding claim 19] are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper No. 11.

[**Note:** claim 19 is withdrawn as being drawn to nonelected species because the examiner believe that applicants made an error on selecting claim 19 rather than claim 20, which does read on the elected species as claimed since claim 19 reads on method for implanting a dopant in a semiconductor structure, which is the non-elected species.]

***Drawings***

2. The drawings are objected to under 37 CFR 1.83(a) because they fail to show a resonant cavity [page 8, line 15], magnetron source [page 8, line 18], magnetic flux with a spiral copper antenna [page 9, line 3], power supply [page 9, line 3], and a ceramic chuck [page 9, line 6] as described in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

***Claim Objections***

3. Claim 3 is objected to because of the following informalities: in line 2 of claim, the limitation "the microwave frequency band" should be changed to --a microwave frequency band-- to avoid insufficient antecedent basis for this limitation in the claim. Appropriate correction is required.

4. Claim 4 is objected to because of the following informalities: in line 2 of claim, the limitation “the radio frequency (RF) band” should be changed to --a radio frequency (RF) band-- to avoid insufficient antecedent basis for this limitation in the claim. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 1-8, 18 and 20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Regarding claims 1 and 18, the claim recites “...a low temperature rapid thermal annealing...” However, the specification does not describe the time range of “rapid” in the LTRTA. One of ordinary skill in the art recognizes that RTA deals with not only temperature but as well as time to control the temperature.

For examination purposes, the examiner is taking the position that any time could be used in the RTA process until further explanation and clarification is given by the applicants. Since claims 2-8 depend off of claim 1 and claim 20 depend off of claim 18, they are rejected for the same reason.

Regarding claims 3-4, the claims recite “...a frequency in the microwave frequency band” and “...a frequency in the radio frequency (RF) band.” On page 8, lines

3-9, teaches that the microwave frequency and radio frequency could use to induce electromagnetic energy to the semiconductor structure. However, the specification does not provide any frequency range for the frequency bands in which the applicants use to help anneal the semiconductor structure.

For examination purposes, the examiner is taking the position that any frequency could be used for the frequency bands until further explanation and clarification is given by the applicants.

7. Claims 1-8, 18 and 20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding claim 1-8, 18 and 20, see above item 6 for details of the rejection.

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

9. Claims 1-8, 18 and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1-8, 18 and 20, see above item 6 for details of the rejection.

***Claim Rejections - 35 USC § 102***

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 1-2, 5-8, 18 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Maekawa (6066547).

Regarding claim 1, Maekawa discloses [see Figs. 9-11] a method for annealing a semiconductor structure (semiconductor compound 30) [see col. 6, lines 30-35], the method comprising, subjecting the semiconductor structure (30) to an oscillating magnetic field [see col. 6, lines 49-67] and, applying a low temperature rapid thermal annealing (LRTA) process to the semiconductor structure (30) [see col. 7, lines 1-18].

Regarding claim 2, Maekawa discloses wherein subjecting includes subjecting the semiconductor to a time-varying electromagnetic field [see col. 6, lines 8-67].

Regarding claim 5, Maekawa discloses wherein applying a LRTA includes exposing the semiconductor (30) to a temperature less than approximately 800 degrees Celsius [prior art discloses between 650-800 as shown in col. 7, lines 7-12].

Regarding claim 6, Maekawa discloses wherein applying a LRTA includes exposing the semiconductor to a furnace having a temperature greater than approximately 500 degrees Celsius, and less than approximately 800 degrees Celsius [prior art discloses between 650-800 as shown in col. 7, lines 7-12].

Regarding claim 7, Maekawa discloses wherein applying a LRTA can precede subjecting the semiconductor to an electromagnetic field [see col. 6, lines 8-67].

Regarding claim 8, Maekawa discloses wherein applying a LRTA includes using a furnace to perform the LRTA [see col. 9, lines 17-19].

Regarding claim 18, Maekawa discloses [see Figs. 9-11] a method for processing a semiconductor structure (semiconductor compound 30) comprising a subjecting the semiconductor structure (30) to a thermal heating [prior art discloses heating between 250-470 degrees Celsius as shown in col. 6, lines 57-63], and applying a low temperature rapid thermal annealing (LRTA) process to the semiconductor structure (30) [see col. 7, lines 1-18].

Regarding claim 20, Maekawa discloses the step of subjecting the semiconductor structure (30) to an oscillating magnetic field to anneal the semiconductor structure (30) [see col. 6, lines 30-67].

***Claim Rejections - 35 USC § 103***

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

14. Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maekawa (6066547).

Regarding claims 3-4, Maekawa discloses [see Figs. 9-11] a method for annealing a semiconductor structure (semiconductor compound 30) [see col. 6, lines 30-35]. However, he does not disclose providing a frequency in a microwave frequency band or the radio frequency (RF) band. It is well known to provide any frequency range in a frequency band where needed (see MPEP 2144.04 *In re Seid*, 161 F.2d 229, 73 USPQ 431 (CCPA 1947). It would have been obvious to a person having ordinary skill in the art at the time the invention was made to subject the semiconductor structure to any frequency range since the frequency range, which involves matters relating to ornamentation only which have no mechanical function, would provide support in a selective manner to each individual user for annealing a semiconductor structure.

### ***Conclusion***

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Splinter et al (4303455), Rohatgi (4522657), Plumton et al (4743569), Grim et al (5011794), Fair et al (5523262), Dawson et al (6044203), Hause et al (6166354), Maekawa (6225197), Lee et al (6316123) disclose a method and apparatus for annealing semiconductor structure with rapid thermal annealing (RTA).

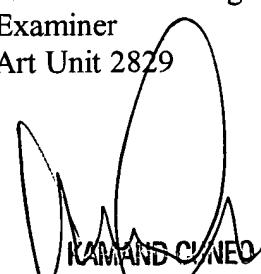
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jermele M. Hollington whose telephone number is (703) 305-1653. The examiner can normally be reached on M-F (9:00-4:30 EST) First Friday Off.

Art Unit: 2829

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on (703) 308-1233. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

*J.M.H.*  
JMH  
September 5, 2003

Jermele M. Hollington  
Examiner  
Art Unit 2829  
  
KAMAND CUNEO  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800